

CLAIM(S):

1. An apparatus for inducing sputum from a patient, the apparatus comprising:
 - a chest compression vest for applying force to a chest region of the patient;
 - a pressure generator connected to the vest for providing an oscillating pressure; and
 - a mouthpiece for placement in a mouth of the patient wherein the mouthpiece minimizes airflow resistance.
2. The apparatus of claim 1 and further comprising:
 - a support which maintains the patient in a generally standing position.
3. The apparatus of claim 1 wherein the pressure generator provides the oscillating pressure at a frequency of between about 5 pressure cycles per second and about 25 pressure cycles per second.
4. The apparatus of claim 3 wherein the oscillating pressure has a frequency which is approximately a chest resonant frequency of the patient.
5. The apparatus of claim 3 wherein the oscillating pressure has a frequency between about 12 pressure cycles per second and about 15 pressure cycles per second.
6. The apparatus of claim 3 wherein the pressure generator provides a positive pressure bias to the vest.

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7. The apparatus of claim 1 wherein the vest has a lower edge for positioning near a bottom of a rib cage of the patient and an upper edge for positioning near a collar bone of the patient.
8. The apparatus of claim 1 wherein the mouthpiece is removable to permit the patient to expectorate an induced sputum sample.
9. The apparatus of claim 1 wherein the mouthpiece extends into the mouth to hold open the mouth and depress a tongue of the patient.
10. The apparatus of claim 1 wherein the mouthpiece has a generally oval cross-section.
11. The apparatus of claim 10 wherein the mouthpiece is about 1.5 inches wide, about 0.6 inches high and extends about 1.5 inches into the mouth.
12. The apparatus of claim 1 and further comprising:
a port on the mouthpiece for connection to a source of an aerosolized solution.
13. The apparatus of claim 12 wherein the mouthpiece has a length adapted for limiting loss of the aerosolized solution.
14. The apparatus of claim 1 wherein the mouthpiece has a first portion adapted for location inside the mouth and a second portion adapted for location outside the mouth, the second portion having a length of about 8 inches.
15. The apparatus of claim 1 wherein the mouthpiece is sized to

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permit an airflow velocity of greater than 50 ml/cycle.

16. The apparatus of claim 15 wherein the mouthpiece is sized to permit an airflow velocity of about 90 ml/cycle.

not shown
17. The apparatus of claim 1 wherein the mouthpiece extends about 1.5 inches into the mouth.

18. The apparatus of claim 1 wherein the mouthpiece is sized to maximize airflow velocity and minimize the loss of an aerosolized solution.

19. The apparatus of claim 1 wherein a sputum sample is induced by the force applied by the chest compression vest.

20. An apparatus for inducing sputum from a patient, the apparatus comprising:

a chest compression vest for applying force to a chest region of the patient;

a pressure generator connected to the vest for providing an oscillating pressure;

a mouthpiece for placement in a mouth of the patient to minimize airflow resistance, the mouthpiece including a port adapted for connection to a source of an aerosolized solution; and wherein the force applied by the chest compression vest induces sputum from the patient.

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21. The apparatus of claim 20 wherein the mouthpiece includes a first portion for holding open the mouth of the patient while depressing a tongue of the patient and a second portion for location outside the mouth, the second portion

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having the port.

NS 22. The apparatus of claim 21 wherein the first portion of the mouthpiece has a generally oval cross-section.

NS 23. The apparatus of claim 22 wherein the first portion of the mouthpiece is about 1.5 inches wide, about 0.6 inches high and extends about 1.5 inches into the mouth.

24. The apparatus of claim 21 wherein the second portion of the mouthpiece has a length which limits loss of the aerosolized solution.

25. The apparatus of claim 21 wherein the second portion of the mouthpiece has a length of about 8 inches.

26. The apparatus of claim 20 wherein the aerosolized solution induces sputum from the patient.

27. An apparatus for inducing sputum from a patient, the apparatus comprising:

means for applying force to a chest region of the patient;

means for providing an oscillating pressure, the means for applying force connected to the means for providing an oscillating pressure; and

means for minimizing airflow resistance wherein the means for minimizing airflow resistance are placed in a mouth of the patient.

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28. The apparatus of claim 27 and further comprising means for maintaining the patient in a generally standing position.
29. The apparatus of claim 27 wherein the means for providing an oscillating pressure provides the oscillating pressure at a frequency of between about 5 and about 25 pressure cycles per second.
30. The apparatus of claim 29 wherein the oscillating pressure has a frequency which is approximately a chest resonant frequency of the patient.
31. The apparatus of claim 29 wherein the oscillating pressure has a frequency between about 12 pressure cycles per second and about 15 pressure cycles per second.
32. The apparatus of claim 29 and further comprising means for providing a positive pressure bias to the means for applying force.
33. The apparatus of claim 27 wherein the means for applying force has a lower edge for positioning near a bottom of a rib cage of the patient and an upper edge for positioning near a collar bone of the patient.
34. The apparatus of claim 27 wherein the means for minimizing airflow resistance extends into the mouth, holds the mouth open and depresses a tongue of the patient.
35. The apparatus of claim 27 wherein the means for minimizing airflow resistance has a generally oval cross-section.

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MS 36. The apparatus of claim 35 wherein the means for minimizing airflow resistance is about 1.5 inches wide, about 0.6 inches high and extends about 1.5 inches into the mouth.

37. The apparatus of claim 27 wherein the means for minimizing airflow resistance is connected to a source of an aerosolized solution.

38. The apparatus of claim 37 wherein the means for minimizing airflow resistance limits loss of the aerosolized solution.

39. The apparatus of claim 27 wherein the means for minimizing airflow resistance has a first portion adapted for location inside the mouth and a second portion adapted for location outside the mouth, the second portion having a length of about 8 inches.

40. The apparatus of claim 27 wherein the means for minimizing airflow resistance permits an airflow velocity of greater than 50 ml/cycle.

41. The apparatus of claim 40 wherein the means for minimizing airflow resistance permits an airflow velocity of about 90 ml/cycle.

MS 42. The apparatus of claim 27 wherein the means for minimizing airflow resistance extends about 1.5 inches into the mouth.

43. The apparatus of claim 27 wherein the means for minimizing airflow resistance maximizes airflow velocity and minimizes the loss of an aerosolized solution.

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44. The apparatus of claim 27 wherein sputum is induced by the force applied by the means for applying force.

45. The apparatus of claim 27 wherein a sputum sample is induced by the force applied by the means for applying force.

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